Technology Tools

By Joe Lawrence

On-Farm Crop Trials

The use of on-farm crop trials present tremendous opportunities to fine tune a crop management program and evaluate crop inputs for their ability to enhance crop production. To have confidence in the information for guiding decision making it is critical that the trials are properly designed and implemented. Unlike a laboratory setting, a number of variables in field scale trials need to be addressed to reduce error and boost the power of the data generated.

On-farm trials evaluate an ever-expanding selection of crop inputs and aid purchasing decisions.

In additional to addressing management strategies, such as tillage and manure management, interest has increased in on-farm trials to evaluate an ever-expanding selection of crop inputs. Company representatives may approach the farm to try out their product or compare their product to the existing farm practice. Conducting your own trials can be a powerful tool, but can also lead you down the wrong path if not properly executed.

Major factors in designing a project include defining a single research question, addressing any potential in-field variability, replication, identifying what information is important to record and how data will be collected. Cornell Agronomy Factsheet # 68, available online at nmsp.cals.cornell.edu/guidelines/factsheets.html, provides technical detail on experiment design and implementation.

In addition to the technical design of the experiment, it is important to recognize that along with the valuable data that can be generated, there are also limitations to their impact.

Each growing season is slightly (or substantially) different from any other season pre or post experiment. Therefore, an experiment limited to one growing season may offer an answer that is limited to that set of growing conditions. It is important to objectively evaluate if the question the trial is based around has a high likelihood of showing consistent or varying results to varying weather conditions.

Some study questions may also be more sensitive to other parameters, such as soil type, elevation, soil fertility, crop rotation history, or pest cycles. An understanding of these potential implications on these parameters of your specific question will provide insight into whether additional testing is needed or not. An experiment may need to be repeated over multiple growing seasons, at different points in a crop rotation or on different soil types to provide truly valuable feedback that can be used by the farm.

It is also critical to look at other research that has addressed the same question, including independent, replicated trials that have the same robust design as your own. This can serve a few purposes. Even if you feel like you have a unique set of conditions, it is reasonable to expect that your results at least show a similar trend to what is expected from the product or practice being evaluated. If your results are completely contrary to all other accepted work, it is prudent to re-evaluate your methods and consider repeating the trial.

A second function is to gain a better understanding of the likeliness of your results holding up under different growing conditions that may have been experienced at other locations where the experiment was done. In the case of crop selection it can be valuable to determine what hybrids or varieties perform best in a specific set of conditions compared to which may perform more consistently over a wide range of conditions.

PRO-DAIRY's Corn-Silage Hybrid Trials

PRO-DAIRY has restarted the Cornell corn-silage hybrid trials. New and leading corn silage hybrids have historically been annually evaluated for yield, moisture at harvest, quality characteristics, and calculated milk yields across NY locations. Corn silage variety tests were not conducted in 2014 or 2015, but with the creation of a Cornell PRO-DAIRY Dairy Forage Systems Specialist position, were resumed on a limited basis in 2016. Re-starting the trials provided PRO-DAIRY with an opportunity to pool resources and increase efficiency by leveraging the expertise of Cornell's Integrative Plant Science Professor in Plant Breeding and Genetics, Margaret Smith, who conducts grain research.

In the corn silage commercial hybrid trials, companies pay an entry fee and choose hybrids to be tested. Farmers use the results for yield comparison and purchasing decisions. In 2016, 29 hybrids from eight companies were tested and more are anticipated in 2017. Hybrids were planted at two NY locations. One is on a farm in Cayuga Country, in the Finger Lakes Regions, and the other is on a farm in St. Lawrence County in Northern NY. Next year's trial will expand to include locations in West and Central or Eastern NY.

The 2016 results are posted on the Cornell Soil and Crop Sciences Variety Trials webpage and PRO-DAIRY's website at https://prodairy.cals.cornell.edu/.

PRO-DAIRY has also begun collaborating on field research with Jerry Cherney, Cornell School of Integrative Plant Science Professor in Soil and Crop Sciences, addressing alfalfa grass management. ❐

Corn Research Trial Planting 2016, Murcrest Farm, Champion, NY

Joe Lawrence (jrl65@cornell.edu) is Cornell PRO-DAIRY's Dairy Forage Systems Specialist.